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Western Forest Insect News

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Forest Insect Investigations
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BEETLE LOSSES IN THE YELLOW PINE OF OREGON AND WASHINGTON.

Enough beetle survey work has been done in Oregon and Washington the past five years to justify rough estimates of the average annual insect loss in yellow pine. At least 90 per cent of these losses are due to the work of the western pine beetle and the mountain pine beetle with brevicomis far in the lead.

The estimates are based on Bureau of Entomology and Forest Service surveys during the past five years (1921-1925 inclusive). At least two-thirds of the yellow pine (Pinus ponderosa) in all classes of ownership was actually covered by one or more surveys during this five-year period. The annual loss figures given in the next sections represent the average annual loss during this five-year period, but these annual loss figures are believed to give a rough picture of what has probably happened in an average year of the past decade or more.

Oregon Losses

The total yellow pine stand, all classes of ownership, is estimated at 76 billion board feet. The yellow pine area covers about 10,000,000 acres. The stand can be divided as follows according to the severity of beetle damage:

25 billion board feet - involved in epidemic infestation most of which is by brevicomis, in which the average annual loss is estimated at 250 million board feet, or one per cent of the stand.

51 billion board feet - involved in endemic or normal infestation, in which the average annual loss is estimated at 153 million board feet or three-tenths of one per cent of the stand.

The total annual beetle killing in yellow pine for the state is estimated at 403 million board feet, a loss of nearly $1,500,000 in timber values, assuming a value of $2.50 per thousand board feet.

Washington Losses

The total yellow pine stand, all classes of ownership, is estimated at 14 billion board feet. The yellow pine area is probably about 2,000,000 acres. The stand can be divided as follows according to the severity of the beetle damage:

3 billion board feet - involved in epidemic infestation, a considerable part of which is a mixed monticolae-brevicomis infestation, in which the average annual loss is estimated at 45 million board feet or one and one-half per cent of the stand.

11 billion board feet - involved in endemic or normal infestation in which the average annual loss is estimated at 35 million board feet or about one-third of one per cent of the stand.

The total annual beetle killing in yellow pine for the state is therefore estimated at 80 million board feet with an average value of $2.75 per thousand board feet, a loss of $220,000 in timber values.

In a subsequent statement, a comparison of these beetle losses will be made with growth in yellow pine.

A. J. Jaenicke.

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CONTROL WORK IN WHITE PINE STAND INSTITUTED.

Control work against an outbreak of the mountain pine beetle in the white pine stands of the Pete Creek Drainage, Kootenai National Forest was started on the 19th of April. Two thousand has been allotted for this project and an attempt will be made to treat all of the infested trees.

J. S. Evenden.

DEVIL'S TOWER HIT BY BLACK HILL'S BEETLE

Five days in the latter part of March were spent at the Devil's Tower National Monument in northeastern Wyoming, examining an infestation of Black Hill's beetle in yellow pine and instructing the custodian of the property in spotting, marking, and treating infested trees. The Tower property is about 1½ miles long by 1¼ miles wide with about half the area covered with timber. A total of 222 trees were marked and it is believed that during the course of treating enough more will be found to bring the total to 250. Control was begun before the writer left, affording an opportunity to inspect the character of the work. It is believed that control work was completed within three weeks. Felling and peeling was recommended for single trees and small groups and burning for the larger groups.

Single trees and small groups, in general, had broods hardly more than holding their own but the brood in the larger groups was quite heavy and had secured a good foothold.

The mild winter had apparently hastened development of the brood and many adults were to be found, in various stages of maturity. Most of the infested trees were decidedly sorrel. Snow had disappeared from all but the more sheltered places.

A. L. Gibson.

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WINTER KILLING OF WHITE PINE FOLIAGE HANDICAPS INSECT SURVEY

During September the writer made an examination of an area in the Kootenai National Forest where the foliage of the white pine trees had been severely injured by what is assumed to have been the sudden drop in temperature which occured in December 1924. Practically every white pine tree in the area showed a discoloration of foliage which at a short distance gave the trees the appearance of having been killed by barkbeetles. This injury varied from a slight discoloration of the old needles at the tops of the trees to a complete destruction of the terminal buds as well as all of the foliage. The severely injured trees were reddish brown in color and gave the appearance of having been killed by barkbeetles in 1924, while those with the buds uninjured and which had produced 1925 needles, presented a faded yellowish appearance which closely resembled the 1925 attacked trees. This condition made the spotting of insect infested trees practically impossible.

J.C.Evenden.

SENSITIVENESS OF THE TREE TO ENVIRONMENT. A FACTOR IN INSECT LOSS.

Nearly always in a forested area completely defoliated by leaf feeding insects, certain trees will die and certain other trees will live. Why this is true, we do not know. It has been suggested that the slowest growing trees die first and that the fastest growing ones live longest.

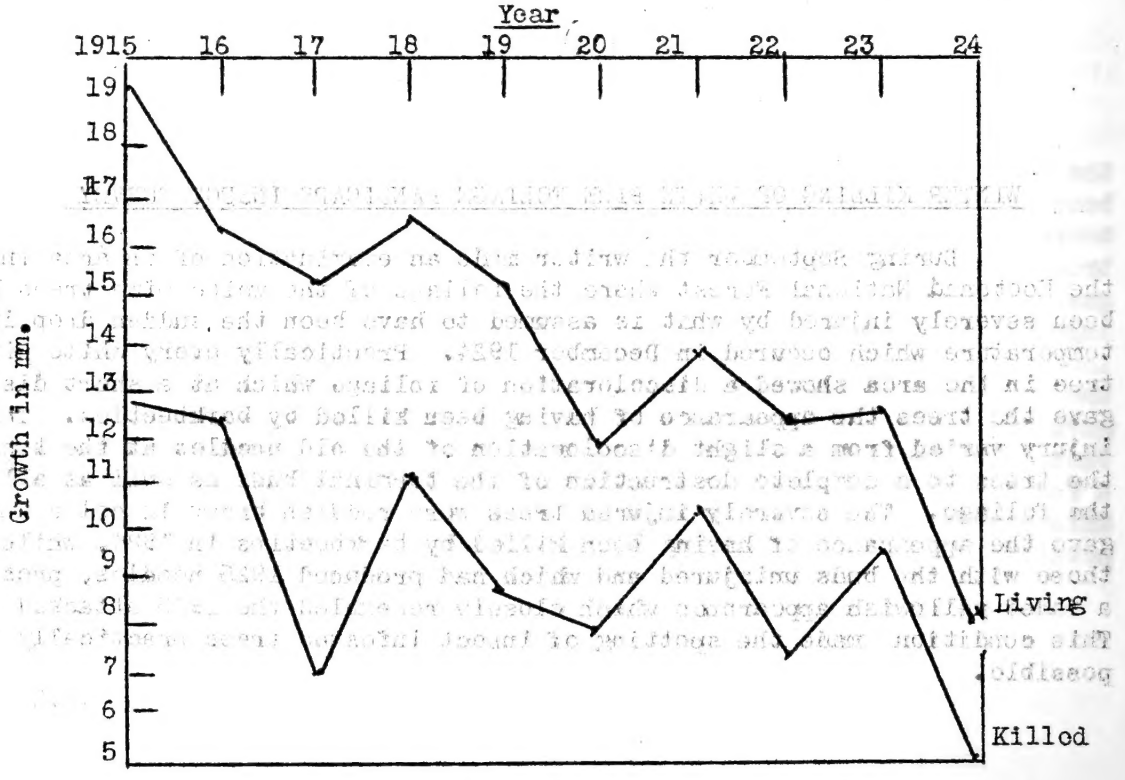
The data taken from a needletyer defoliated area of lodgepole pine in the Madison Valley of southwestern Montana indicates that the sensitiveness of the individual tree to environmental changes may be one factor in this ecological complex.

The cores from which the data for the following chart were taken were obtained October 1, 1925, from trees that were completely defoliated during the summer of 1924. Ten produced no foliage during 1925 and were dead; ten produced a crop of new needles during 1925 and were alive. Neither produced any new wood.

As will be seen by the chart, the ten trees which died were slower growing than the ten trees which lived. Also, however, during all but one of the eight years preceding the defoliation in 1924, they were more sensitive to the factors which controlled growth. During the good years they grew considerably faster, and, during the poor years, considerably slower than the trees that lived.

Why should we not consider that this extra sensitiveness to environmental change was not the real reason why they were unable to survive the defoliation?

H. E. Burke



WHERE IS OUR YELLOW PINE?

It is generally recognized, I believe, that in the West the biggest single forest insect control problem just now is that of Dendroctonus infestations in western yellow pine. It may be of interest, therefore, to know something of the distribution of this beetle-troubled species in the Rocky Mountain and Pacific Coast regions.

According to the latest figures, the western yellow pine stand (Pinus ponderosa). including all classes of ownership, is as follows, in billions of board feet:

California	77
Oregon	76
Idaho	17
Washington	14
Montana	10
Nevada, Utah, Colorado, Arizona, and New Mexico	39

Total 233 billion board feet.

The Pacific Coast region (California, Oregon, and Washington) therefore, has 167 billion board feet of western yellow pine and the Rocky Mountain states have 66 billion board feet of the same species.

California and Oregon have two-third of the western yellow pine stand of the nation within their fair borders. The California stand slightly exceeds that of Oregon, but if the 13 billion board feet of Jeffrey pine are included, California's claim to first place cannot be disputed.

The British Columbia yellow pine stand is four billion board feet, only one per cent of the total stand of timber in the province.

A.J. Jaenicke.

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BIG HOLE BASIN CONTROL PROJECT UNDERWAY

Spotting and marking of the lodgepole pine trees infested with the mountain pine beetle started in the Big Hole Basin, Montana, on April 20th. Actual control work will start on May 1st, and will continue until the 10th or 15th of June. $12,000 have been allotted for this project.

J.C. Evenden.

BUGS IN THE DOUGLAS FIR REGION

It is sometimes erroneously assumed that the forest insect problems in the Douglas fir region are not of much consequence. It is true that in Oregon and Washington the most pressing insect problem just now is probably the bark-beetle situation in western yellow pine, but Douglas fir and its associated species have their insect troubles too.

Some of the outstanding insect problems of the Douglas fir region are:-

Caterpillar and aphid defoliations in Douglas fir, Sitka spruce, and western hemlock. In Tillamook County, Oregon, the western hemlock looper killed nearly a half a billion board feet of Douglas fir and western hemlock in the period 1919-1922.

Bark-beetle infestations in Douglas fir and Sitka Spruce. These are ordinarily of much lesser severity than bark-beetle attacks in the pine stands of the Pacific Coast and Rocky Mountain regions.

Damage to the heartwood of living western red cedar by the cedar borer. The shingle industry is particularly interested in this situation.

Injury to green felled material, such as logs left in the woods one season or more, by pin-hole borers and flat-headed and round-headed borers. The wood of nearly all species of conifers in the region are susceptible to these attacks.

Deterioration of fire-killed and windthrown timber by timber borers.

Wood-borer damage to green logs and wood-borer activity in fire-killed and windthrown timber are beetle problems of special interest to the lumber industry of the region.

A. J. Jaenicke.

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AMERICAN BORER WORRIES NEW ZEALAND TIMBERMEN

"Fruit growers in the Nelson (New Zealand) district report that hemlock fruit case shook recently imported from Canada and America are riddled with borer, and fears are entertained lest the pest finds a footing in New Zealand forests. The government entomologist has identified the borings as the work of the destructive Deudrocdonus beetle which is to be found in some of the Canadian and American forests." "New Zealand Import Controversy". March Timberman.

It is news to us that Dendrocdonus (Dendroctonus) riddles wood and that it attacks hemlock.

H.E. Burke

WINTER KILLING STUDY
Coeur d'Alene, Idaho.

The climatological data of the U.S. Department of Agriculture, Weather Bureau show that the month of December 1924 was the coldest on record for the states of Idaho and Montana, and with one exception in 35 years of record for the State of Washington. Moderate temperatures prevailed during the first half of the month. On the 15th the greatest variance in temperature occurred in northern Idaho, with a maximum of 46 and a minimum of 5 degrees. This change took place within a few hours and was followed by five days of cold weather with a minimum varying from 6 to 13 degrees below zero. By the first of February 1925, large and small groups and individual yellow pine trees scattered throughout the stands showed a great variation in discolored foliage, from a few fading needles to a 100% red discoloration. Probably owing to the moderate temperatures prevailing during the first half of December 1924, the plant life, particularly the fruit trees, shrubs, and native conifers were still in a growing condition and the abrupt change in temperature may have resulted in a too sudden arresting of growth, the effect of which was most noticeable on the foliage of the yellow pine. This condition brought many inquiries as to the recovery of the yellow pine, and in order to secure data concerning the future of the trees and the possibility of their weakened condition making them more susceptible to insect attack, four study plots were established in the vicinity of Coeur d'Alene, Idaho. One year's observations of these plots, dating from March 1st, 1925, to March 1st, 1926, have given the following results:

Foliage conditions for the four plots recorded for March 1925 placed the east exposure first with 74½% discolored, south next with 64% and west third with 62%.

A difference of 78% between the 1925 increment and the average for the preceding 5 years occurred on the east exposure, 71 1/3% on the south exposure and 64% on the west.

On the east exposure 21% of the trees made no 1925 growth in increment, the south 25% and the west 31%.

No consistency in difference between the 1925 increment and the average annual increment of preceding 5 years between the fast and slow growing trees could be established.

A comparison of foliage conditions for March 1926 showed the south exposure to be 66% normal, west 62% and east 58%.

Total loss of trees on four plots for 1925, 3.5%. Winter killing primary and insect attack secondary.

Observations for the year 1926 may show many other variations in foliage conditions and losses.

Henry J. Rust.

SOME EFFECTS OF EXTREME TEMPERATURE FLUCTUATIONS ON CONIFERS IN THE BITTERROOT VALLEY, MONT.

The destructive effects of the severe December thaw and freeze on vegetation reported throughout Idaho, western Montana, eastern Oregon and Washington, was very pronounced on yellow pine in the Bitterroot Valley, as observed on July 24-26, 1925. At this time the foliage was decidedly yellow or brown and presented a very characteristic appearance to the valley floor and surrounding hillsides. Among the conifers only yellow pine was affected and only to an elevation of 5,500 feet, being quite light above 5,000 feet. It is recorded by forest officers that in other regions Douglas fir, spruce and many deciduous shrubs were severely injured. Many orchards in this valley were almost completely killed, particularly pear trees.

The most conspicuous feature was the extreme erraticalness of the injury. Below 5,000 feet elevation approximately 75% of the yellow pine was more or less affected. In some cases extensive groups were injured or again only a few trees within a clump or even a single tree. The injury apparently bears no relation to rate of growth, situation or exposure although at the bottoms of the deeper canyons there was noticeably less injury. The latter suggests an explanation based on the fact that the extremely warm weather preceding the drop in temperature activated certain individuals more than others and those that most readily responded were most seriously injured by the freeze. Observations on the opening of the buds in the spring of the year clearly show that all individuals do not respond alike. In the deeper canyons where the sunlight did not reach the trees, except for a few hours of the day, there would obviously be less response. This would also explain the severe injury to pear trees which start growth early in the spring.

Reproduction on the whole suffered more seriously than mature trees. It is quite likely that about 50% of the trees had practically all the needles killed, resulting in complete defoliation. Some of these trees did not open the buds in the spring and are now completely dead and infested with Ips. Possibly 1% of the trees were in this condition. Others developed new growth on some buds which withered either before or after full development of the needles. Most of the trees put out new growth on at least 50% of the terminal buds. In a few cases, practically all the buds developed even though all the old needles were killed. A number of trees that were examined showed practically no annual layer of wood except for a very narrow band of spring wood which possibly might have been formed during the few warm days preceding the freeze. The new growth developing from the terminal buds, particularly those trees in which only 50% or less of the buds have developed, had an unhealthy appearance. The foliage was lighter in color and the phloem was brown in spots. It is possible that many of these trees will die; in fact, it would not surprise me if the total mortality within the next two or three years will exceed 25%.

Detailed records of the change in temperature have not been obtained for Missoula, the nearest weather station, but for Helena, Mont., the Monthly Weather Review reports a maximum temperature of 63° for December 14th which fell to 16° below the following day - a change of 79° in 24 hours.

F. C. Craighead.

TREE AND SITE CHARACTERISTICS PREFERRED BY THE WESTERN PINE BEETLE

A report has just been completed on studies on the characteristics of the trees selected for attack by the western pine beetle. It has been quite definitely shown that D. brevicomis kills the slower growing trees. From comparative studies of cores from 1000 D.b. killed trees and about an equal number of living check trees of the same site and size the following was found:

The D. b. killed tree was growing slower than its living check in 75% of the cases compared.

The average growth rate of the d.b. killed trees was about 40% less than the growth rate of living check trees.

While nearly 45% of the D.b. killed trees showed a diameter growth of less than .4 millimeters a year only 17% of the living check trees were growing that slowly.

91% of the D.b. killed trees had an annual diameter growth of less than 2 millimeters.

While it was found that D.b. showed a preference for the slow growing trees under all the conditions studied this preference varied in degree with the area and the status of the infestation. It is believed the preference is more marked under endemic or increasing epidemic conditions than under balanced or decreasing epidemic conditions.

Considering external characters, D.b. evidently prefers the shorter trees in diameter classes between 20" and 30". Some preference is shown for flat topped trees while trees with sharp pointed crowns are relatively free from attack.

D. brevicomis also shows an apparent preference for certain sites. In general the poorer sites with open, pure yellow pine stands along ridges or any exposed location are preferred by D.b.

A study on the Cascadel area of the Sierra N.F. showed that the D.b. loss per unit area varied inversely with the quality of the site, the heaviest losses being found on the poorest sites. Whether this site selection is due directly to site characteristics or to the characteristics of the trees on the site has not been determined.

The importance of these studies lies in their application to timber marking practise. If we can distinguish the trees most likely to be killed by insects the insect loss on cutover areas can be reduced by taking out all such trees in the first cut.

H.L. Person.

BARKBEETLE EPIDEMIC IN WHITE FIR DECLINES IN THE YOSEMITE

During the seasons of 1924 and 1925 a conspicuous killing of both white fir and red fir occurred in many parts of the Sierra Nevada region. The tops of large mature trees died down for 30 feet or more and many small trees under 20" D.B.H. were killed outright. Much of this damage was the result of attacks by a small barkbeetle, Scolytus subscaber Lec. These insects are capable of living in the green cambium and quite often breed in small areas of cambium under the bark surface without killing the entire tree.

On the Yosemite this killing was quite noticeable in the fir belt around the rim of the Valley. Groups in which 100 trees or more were killed were noticeable in the Little Yosemite region and in the Snow Creek and Yosemite Creek watersheds. A number of trees were killed in the main camp sites on the Valley floor. An allotment of $500. was made from National Park funds to carry out control measures on the areas where the trees are needed for cover for camp sites or scenic purposes. This work was planned for the spring of 1926, the method considered being that of cutting the infested trees and destroying the broods by burning.

An examination was made of the situation on the Valley floor and the Little Yosemite early in April, when it was found that trouble was subsiding very rapidly from natural causes. Many of the barkbeetle broods were heavily parasitized by chalcid flies. In some trees this parasitism amounted to 75% and more of the entire broods. Because of this condition no control work was undertaken as the method would have destroyed the parasites as well as the barkbeetles. It now looks as though the trouble will very largely subside during the 1926 season.

J.M.Miller

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FIELD ACTIVITIES START

J.E. Patterson left Palo Alto April 21st for Ashland, Oregon. Patterson will have charge of the control work to be conducted against bark beetles in the forests of Crater Lake National Park. Due to the early season, control work against the western pine beetle in the yellow pine will start about May 1st. Later in the season work will be conducted against the mountain pine beetle in the lodgepole forests south of Crater Lake.

F.P. Keen and W.J. Buckhorn expect to leave for Klamath Falls, Oreg., May 4th. During May and June they expect to make a re-survey of the Southern Oregon-Northern California Project areas to determine the 1925 infestation.

H.E. Burke.

A SITKA SPRUCE INFESTATION.

The following is quoted from the March 6, 1926, issue of the Seattle Post-Intelligencer:

"A new menace to the great forests of the Olympic Peninsula (northwestern Washington) in the form of the bark or engraver beetles is causing alarm among settlers of the peninsula. The beetle, thriving in millions of feet of blow-down timber (referring to the historic blow-down of January 29, 1921), is infesting green timber in many cases and threatens to engulf the whole supply."

Inquiries have led to the belief that Sitka spruce is the species suffering the most, and that probably Dendroctonus obesus is the culprit. But just how the infestation can have any connection with the blow-down of five years ago, is not clear. Since the scene of the infestation is probably close enough to the Olympic National Forest to jeopardize government timber, a field examination may be made this spring.

A.J.Jaenicke.

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MANUSCRIPTS

Burke, H.E. - The Economic Importance, Ecology and Control of the Pacific Flathead Borer (Chrysobothris mali, Horn.) Submitted for publication as a Department bulletin.

Burke, H.E. - The Western Cedar Pole Borer. A complete study of this insect as we know it today. Submitted for publication as a Department bulletin.

CURRENT LITERATURE

Fisher, W.S. - A New Acmaeodera from Nevada Infesting Purshia (Col. Buprestidae) Ent. News, XXXVII, Apr. '26, pp. 114-115.

Keen, F. P. - Pine Beetle Control in Southern Oregon and Northern California. The Timberman, March 1926, pp. 178, 180,182. An account of the project, work done, results, what control will and will not do, when to undertake work.

Snyder, T. E. - Notes on Termites from Arizona with Descriptions of two New Species. Univ. of Cal. Pub. in Zoo. Vol. 28 pp. 389-97. Figs.1-6 Apr. 5, 1926. Includes list of known species of Termites of Arizona.

Snyder, T. E. - Preventing Damage by Lyctus Powder Post Beetles. Farm. Bull. No. 1477 U.S. D.A. Describes injury and habits of this genus of beetles and gives the latest methods of prevention and control.

REPORTS

Keen, F.P. - Report on Some Studies Relating to the Control of the Black Hills Beetle, Kaibab National Forest 1925. Notes and tables of data on the relation of climatic influence upon beetle epidemics, coorelation of bark counts and new infestation, relation of losses to forest increment, comparison of control methods and costs, seasonal history of D. ponderosae as related to period of control.

Keen, F.P. - Report of Experimental Control Work, Dry Park, Kaibab National Forest, Oct. 1924. An account of some experiments with various methods of treating Black Hills beetle infested Yellow pine, including costs, effectiveness, etc.

Keen, F. P. - Statistical Report of Survey on Southern Oregon - Northern California Pine Beetle Control Project. During Season 1925. Statistical Report No. 4. Data on loss of 1924, summary of the yellow pine losses for period 1920-1924, summary of all control work for same period.

Keen, F.P. - Southern Oregon - Northern California Pine Beetle Control Project. Progress Report No. 4, July 1, 1924 - June 30, 1925. An account of the work done during the year on the project.

Gibson, A.L. - Progress Report of Study of Epidemic of Dendroctonus monticolae in Lodgepole Pine and Yellow Pine Bitterroot National Forest, 1925. Includes "Investigative Program of the Coeur d'Alene Station for the Field Season of 1926" by James C. Evenden.

Patterson, J.E. - Barkbeetle Loss in Parker Mt. Burn. An account of a burned area in which 12% of the yellow pine and 5% of the sugar pine were killed by the fire, 27% of the yellow pine and 15% of the sugar pine were killed by subsequent attack by barkbeetles; and 61% of the yellow pine and 80% of the sugar pine survived.

Person H.L. - Report on Studies on Tree Selection by the Western Pine Beetle. Notes and graphs on site selection, tree selection and importance of tree resistance with suggestions for further studies.

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ADVERTISING DOES BRING RESULTS.

For once in our short career we have more material than we can use in a current issue. Thank you. Please do not get discouraged if your leading article is missing. We try to give the shorter articles and those with a direct bearing on the western work first place. We intend to get out another issue June 1st and will make an attempt at that time to clean the slate of all accumulated material. Again, thank you.

H.E. Burke.